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How To Control The White Pine Weevil With A Hand Sprayer

The white pine weevil is the most serious insect enemy of white pine in the Northeast, where more than 75 percent of these valuable trees are weeviled. Weevil larvae feed just beneath the bark; this kills the leader, causing forks, crooks, and a subsequent degrade of timber. In fact, widespread damage by the weevil has reduced the demand for white pine planting stock considerably.

During recent years an outstanding technique has been developed for protecting young trees. Concentrated lead arsenate is applied to the leader by means of a hand-operated knapsack sprayer. The method is particularly valuable for areas up to 10 acres.

Blocks of 5,000 to 8,000 trees have been sprayed this way in New Jersey, Connecticut, Massachusetts, New Hampshire, and Vermont; and in all cases less than $\frac{1}{2}$ percent of the trees were weeviled the year the spray was applied. Costs have averaged $6 per 1,000 trees with labor at $1 per hour. Aircraft spraying, using DDT, appears promising for large areas, but is, of course, impractical for small ones.

When To Spray

Spraying with lead arsenate can be done any time in late winter or spring before the adult weevils emerge from the duff and commence feeding. In Connecticut, spraying must be completed by the end of April.

What Materials To Use

Lead arsenate.--This is the favored insecticide for several reasons: (1) It has consistently given perfect and near-perfect control; (2) it remains toxic to the weevil for at least several months; and (3) the white deposit is visible at a glance so there are fewer misses. To avoid clogging of the nozzle and too-rapid settling of the suspended material, use only the finest grades of lead arsenate. Chipman Standard and DuPont Nurex-form lead arsenate have given consistently excellent results Pre-season testing may be needed to find suitable brands of lead arsenate.

Spreader or wetting agent.--A number of materials are satisfactory for this purpose. The preferred spreader is Santomerse-S, produced by the Monsanto Chemical Company. Any of the new detergents such as Tide, Dreft, etc., are acceptable and may be used dry or as a stock solution (made by dissolving 10 ounces in 1 quart of hot water).[1]

Oil.--The use of a drying oil makes the spray stick to the tree despite adverse weather. Either raw linseed or fish oil can be used; but linseed oil is preferred because it smells better.

Formula And Mixing Procedure

The formula for concentrated lead arsenate spray is as follows: lead arsenate 1 part; water 10 parts; oil 0.3 parts; spreader 0.02 to 0.03 parts. To prepare 5 gallons of spray mixture:

1. Pour 1½ to 2 gallons water into mixing barrel.
2. Add 2 ounces dry weight (or 6 fluid ounces) of spreader such as Dreft, Tide, or other wetting agent. Mix.
3. Add 4 pounds lead arsenate. Mix.
4. Add 20 fluid ounces linseed oil. Mix.
5. Add water to make 5 gallons spray mixture.

Equipment Needed

Sprayer.--Concentrated sprays can be applied with a variety of equipment from a small hand atomizer to the knapsack sprayer. The knapsack sprayer made by D. B. Smith Company of Utica, N. Y., has been used almost exclusively in our tests and has proved highly satisfactory. The back-carried sprayer is practically a necessity for plantation work.

Strainer.--Concentrated sprays should be strained into the spray tank through 40-to-50-mesh metal cloth or six layers of cheesecloth to avoid clogging the spray nozzle.

Spray rods.--A 4-foot rod with 3½ feet of hose attached is recommended for spraying all trees up to 10 feet. Rods can be made up from 2-foot sections available from spray-equipment manufacturers; or inexpensive ¼-inch aluminum tubing and standard ¼-inch fittings can be used to make

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[1] Mention of commercial products is not to be construed as endorsement of them by the Forest Service or Department of Agriculture.

spray rods of any desired length. Bamboo should be bound to the tubing for support.

Nozzle.--Concentrated sprays demand a new type nozzle with an opening only one-third that of the older style nozzles. Under field conditions the delivery rate should be 1 to 2 gallons per hour. The "IS" nozzle made by the Spray Engineering Company of 115 Central Street, Somerville, Mass., was used throughout our tests; the results recommend it strongly. The strainer should be removed from this nozzle when lead arsenate is used.

How To Spray

Thoroughness in treating each leader is essential. The sprayer should be swung sideways several times before pumping to insure adequate agitation of the lead arsenate. The nozzle should be held 2 to 4 inches from the tree, and the terminal bud cluster should be saturated from above. The upper two-thirds of the leader must be covered with spray; two passes from opposite sides of the leader should suffice. If the tree has been weeviled, each of the new leaders must be sprayed.

How Often To Spray

Only two treatments should be needed to protect the stand until straight 16-foot butt logs are assured. Annual surveys must be made to determine weevil conditions. The first treatment should be made when 2 to 5 percent of the trees are weeviled in one year. In infested areas, the stand will probably be 2 to 3 feet high at this time.

After the initial knockdown it will take an average of 4 years before weeviling builds up to 10 percent in one season, the next critical time. The second spray should be applied when weeviling reaches 10 percent. By the end of the second 4-year period the stand should be 16 feet or more in height. Entire blocks should be treated at one time to prevent rapid reinfestation from adjacent infested stands.

Salvage Spraying

Stands already heavily weeviled may be reclaimed or salvaged by removing all the heavily damaged trees, cutting back the lightly injured trees to one leader, and then following with a regular spray program. Dense stands will be improved by the thinning, and the spraying of the thinned stand is a much simpler operation.

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